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Appl Brief
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T. BELL
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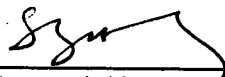
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: Geoffrey T. Haigh and Baoxing Chen
Serial No: 09/838,520
Confirmation No.: 9453
Filed: April 19, 2001
For: NON-OPTICAL SIGNAL ISOLATOR

Examiner: R. Deberadinis
Art Unit: 2836

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WASHINGTON, D.C. 20231

Sir:

APPLICANTS' BRIEF ON APPEAL

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Real Party in Interest

Analog Devices, Inc., Norwood, Massachusetts, USA, is the assignee of the above-identified application (see reel/frame 12443/0878) and is the real party in interest.

Related Appeals and Interferences

There are no related appeals or interferences known to the Appellant, the Appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Claims

Claims 1-27 have been filed. Of these, claims 1-13 have been cancelled. Claims 14-27 remain in the application and all of claims 14-27 stand rejected and are appealed. The claims on appeal are set forth in the attached appendix titled, appropriately, "Claims on Appeal."

Status of Amendments

On even date herewith, an amendment to the specification was filed. There have been no post-final rejection amendments to the claims.

Summary of Invention

The invention defined in the claims involved in this appeal is a signal isolator of the type used to provide electrical (i.e., galvanic) isolation between two different electrical circuits or sources and circuits. Page 1, lines 16-26. More particularly, the invention relates to an isolator wherein the isolation barrier is not optical in nature (page 3, lines 5-6) and an isolation barrier is formed on one or two silicon die (see SUB 1 and SUB 2 on Fig. 5; SUB 1' and SUB 2' on Fig. 9; and SUB 1" and SUB 2" on Fig. 10) using passive elements such as two pairs of capacitor plates (e.g., 130, 134 and 131, 136 in Fig. 9) or two pairs of coil windings (e.g., L1, 140 and L2, 142 in Fig. 10), preferably creating a vertical structural arrangement with a dielectric (and in the case of windings, a Faraday shield, 50) between the passive elements. Page 4, lines 3-6. According to one aspect, an isolator according to the invention may be monolithically fabricated. Using the example of a coil-magnetoresistive sense element arrangement, with two die, the driver circuitry may, for example, be formed on the first substrate and the coil(s), MR element(s) and receiver may be formed on a second substrate.

The structures thus have first and second passive components isolated from third and fourth passive components. Page 4, lines 15-16. The first and second components may be coils with the third and fourth component coils or MR elements, or the components all may be capacitor plates. The structures are made with first and second passive components on the substrate, an insulating layer (51 or 208) over the first and second passive components, and third and fourth passive components on the insulating layer. Page 4, lines 16-20. Desirably, there is a Faraday shield between the first and second passive components when they are coil windings, on the one hand, and the third and fourth passive components, on the other. The first and second passive components are preferably referenced to a first electrical ground (GND1) while the third and fourth passive components are referenced to a different, galvanically isolated, second ground (GND2). The Faraday shield, if present, also is connected to the second ground. An input node through which an input signal is supplied to drive first and second passive components is referenced to the first ground and an output node through which an output signal is obtained from the third and fourth passive components is referenced to the second ground.

Issues

Claims 14-27 have been rejected on the ground of non-statutory double patenting under the judicially created doctrine of obviousness-type double patenting over claims of U.S. Patent No. 6,087,882 (Chen) in view of Gutierrez, Patent No. 5,969,590 and Douglass Patent No. 5,786,979. The sole issue on appeal is whether any of claims 14-27 properly stand rejected on this ground.

The Office Action also indicates on page 4 that "Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over CHEN 6,087,882 in view of DOUGLASS 5,786,979." However, in a telephone conversation with the Examiner on January 30, 2003, it was confirmed that the Examiner did not intend to make and it is his position he did not make a separate rejection of claim 15 under Section 103(a). The Examiner states that he was merely articulating that claim 15 was rejected for obviousness-type double patenting over the combination of Chen and Douglass without reference to Gutierrez. It appears that with respect to claims 16-19, only Chen and Douglass are applied. Consequently, it appears correct to restate the Office Action as setting forth two separate double patenting rejections, the first being claims 14 and 20-27 over Chen in view of Gutierrez and Douglass and the second being claims 15-19 over Chen in view of Douglass.

Again, the sole issue for appeal is whether any of claims 14-27 stand properly rejected for obviousness-type double patenting over claims of Chen '882 in view of either Douglass alone or Douglass in combination with Gutierrez.

Grouping of Claims

There are two independent claims, claims 14 and 15. Applicant believes its arguments apply with equal force to both independent claims.

Argument

A. The Office Action fails to set forth the claims of Chen which provide the basis for the rejection and impermissibly relies on the disclosure of Chen.

Claims 14-27 have been rejected for obviousness-type double patenting over Chen. Such a rejection requires the Examiner to support the asserted obviousness of the *claims* of the application over the *claims* of Chen. However, not once does the Examiner refer to any *claim* of Chen. To quote the venerable Manual of Patent Examining Procedure (MPEP) at Section 804 under heading II.B.1, "In determining whether a non-statutory basis exists for a double patenting rejection, the first question to be asked is does any *claim* in the application define an invention that is merely an obvious variation of an invention *claimed* in the patent?" If not, there is no "unjustified extension" of the term of the right to exclude granted by the issued patent. Consequently, on its face, the double patenting rejection herein is improper and unsupported.

Moreover, as the MPEP admonishes, in the same section, "When considering whether the invention *defined in a claim* of an application is an obvious variation of the invention defined in the claim of a patent, *the disclosure of the patent may not be used as prior art.*" (*Id.*; emphasis added.) Only the portion of the specification that *supports* the patent claims may be considered. *In re Vogel*, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970). To do otherwise is an improper attempt to make a 103(a) rejection using a reference that is unavailable because of common ownership at the time the invention was made, per Section 103(c).

Further, Section 804 of the MPEP directs that form paragraph 8.33 and the appropriate one of form paragraphs 8.34-8.37 may be used to make non-statutory rejections of the obviousness type. Form paragraphs 8.34 and 8.36 are those which relate to an obviousness-type double patenting rejection where, respectively, there is either no secondary reference or one or more secondary references. In both cases, the paragraphs specifically recite the rejected claim and then indicate the *claim* of the issued patent over which the application claim is being rejected. There is no such articulation in the instant rejection. Only a vague reference to "claims of" the Chen patent. Applicant is left to guess which claim or claims form the foundation for the rejection. This is manifestly improper. The failure of the Examiner to follow the dictates of the Manual of Patent Examining Procedure subjects Applicant to arbitrary and

capricious treatment in contravention of the Administrative Procedures Act and leaves Applicant to fabricate or presume a rejection that wasn't made, in order to respond to it.

Chen has ten claims, only claim 1 being independent. Claim 1 requires (1) an input node for receiving an input signal; (2) at least one magnetic-field generator for generating a magnetic field corresponding to the input signal; (3) a magneto-resistive sensor operable for receiving the generated magnetic field and supplying a signal at an output node that corresponds to the magnetic field, said sensor including at least one spin-valve resistor; and (4) a receiver circuit including a strobe generator to generate strobes to control the supply current to said at least one spin-valve resistor. By contrast, claims 14 and 15 of the instant application require:

14. A signal isolator comprising:
 - a first substrate;
 - a first passive component formed on the first substrate;
 - an isolation layer formed over the first passive component;
 - a second passive component formed over the isolation layer;
 - the first and second passive components being coils;
 - an input for receiving an input signal; and
 - a driver circuit coupled between the input and one of said passive components.
15. A signal isolator comprising:
 - a first substrate;
 - a first passive component formed on the first substrate;
 - an isolation layer formed over the first passive component;
 - a second passive component formed over the isolation layer;
 - the first and second passive components being capacitor plates;
 - an input for receiving an input signal; and
 - a driver circuit coupled between the input and one of said passive components.

Note that in claim 14, the first and second passive components are required to be "coils" while in claim 15, they are required to be "capacitor plates." There are no spin-valve resistors and no strobes for them.

The Office Action notes correctly that Chen does not disclose a second passive component being a coil but then states "CHEN, however, does disclose that transformer based

isolators are well known" (citing the background section at column 1, lines 20-22). It then asserts that Gutierrez discloses an integrated circuit transformer with inductor-substrate isolation, including the first and second passive components being coils and leaps to the conclusion that it would have been obvious to design a signal isolator comprising an integrated circuit transformer wherein the second passive component is a coil to provide a transformer based isolator per Chen's acknowledgement that the prior art included transformer-based isolators. The conclusion is factually erroneous and legally improper.

To understand the fatal flaw in the reasoning, one need only recognize that (a) the Examiner has failed to focus on Chen's claims and (b) he has impermissibly resorted to a portion of Chen's specification (i.e., the background section) which does not support his claims. As noted above with reference to *In re Vogel*, this is improper.

B. Chen teaches away from the claimed invention

Further, even if such resort to the specification were proper, Chen's statement at lines 20-22 of column 1 that "transformer based isolators are known" needs to be taken in proper context. Chen merely states that "There are three commonly known isolation methods: opto-couplers, capacitively coupled isolators, and transformer based isolators." Continuing in that column, Chen goes on to state that

"transformer-based isolators are essentially AC coupled, and have limitations in their size and the ability to reject common mode voltage transience. All of the three types of isolators suffer from their difficulties in IC integration, and sometimes they even require hybrid packaging."

After establishing these problems, Chen then proceeds to discuss, as a more favorable alternative, a new isolation technique based on GMR resistors. Chen presents the use of GMR-based isolation as a solution to such drawbacks of the prior art, and describes a monolithic digital isolator which consists of a driver circuit, on-chip coils, on-chip spin-valve sensing elements (i.e., GMR elements) and a receiver circuit. Consequently, though Chen et al acknowledges their existence, he specifically teaches away from using a transformer-based isolation architecture. There is no hint whatever in Chen to use anything other than spin-valve elements to sense the magnetic field generated by coil L1. To the extent that Chen teaches or suggests alternatives, they are alternative spin-valve resistor arrangements. Chen et al note that although the sensor is shown as a bridge circuit, a single GMR spin-valve element or two spin-valve elements may be employed instead, and four elements can be arranged in a manner other than as a bridge. Column 5, lines 11-16. However, they *never* suggest that a coil or coils can be used *instead of* spin-valve resistors.

This is quite understandable as to change from the Chen et al coil/GMR combination to the use of a chip-scale transformer(s) requires changes to the driver and receiver circuitry and the entire isolator structure. One example is that if the same basic set/reset signaling is used, one must use two transformers in place of one GMR/coil combination. Another example that allows for the use of only one transformer involves alternative signaling schemes (continues, burst, etc.) addressed in other commonly-assigned applications. A third example is that the GMR structure is responsive to the magnitude of an applied magnetic field while the secondary coil of a transformer is responsive to the magnetic field rate of change. This has implications for the design of the coils and the circuitry, depending on whether a transformer- or GMR-based approach is used. Thus, there is far more to establishing a signal isolator than simply swapping out the GMR structure with a second coil. This makes the notion of a chip-scale transformer-based isolator far from obvious relative to the GMR-based isolator of Chen et al.

Manifestly, therefore, Chen et al teaches away from the claimed invention and it is not properly combinable with Gutierrez or Douglass to arrive at the claimed invention. Certainly, the express teaching away defeats any hindsight argumentation that Chen et al would suggest the combination. Neither do the other references suggest the combination. A non-speculative teaching of the combination must be found somewhere; or, lacking same, the rejection must be withdrawn. In re Sang Su Lee (Fed. Cir. 2002). The proposed combination of references is therefore legally improper.

Conclusion

For each and all of the foregoing reasons, the final rejection should be reversed.

Respectfully submitted,



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Claims on Appeal

14. A signal isolator comprising:
 - a first substrate;
 - a first passive component formed on the first substrate;
 - an isolation layer formed over the first passive component;
 - a second passive component formed over the isolation layer;
 - the first and second passive components being coils;
 - an input for receiving an input signal; and
 - a driver circuit coupled between the input and one of said passive components.
15. A signal isolator comprising:
 - a first substrate;
 - a first passive component formed on the first substrate;
 - an isolation layer formed over the first passive component;
 - a second passive component formed over the isolation layer;
 - the first and second passive components being capacitor plates;
 - an input for receiving an input signal; and
 - a driver circuit coupled between the input and one of said passive components.
16. The isolator of claim 14 or claim 15 wherein the first substrate is a semiconductor substrate.
17. The isolator of claim 16, wherein the driver circuit also is formed on the first semiconductor substrate.
18. The isolator of claim 16, further comprising a second substrate, wherein the driver circuit is formed on the second substrate.
19. The isolator of claim 14 or claim 15 wherein the first passive component is formed on top of the first substrate.
20. The isolator of claim 14 or claim 15 wherein the first passive component is formed into the first substrate.

21. The isolator of claim 14 or claim 15, further comprising a third passive component on the substrate, a second isolation layer over the third passive component, and a fourth passive component formed over the second isolation layer, wherein the driver circuit provides signals to the first and third passive components.
22. The isolator of claim 14 or claim 15, further comprising a third passive component on the substrate, a second isolation layer over the third passive component, and a fourth passive component formed over the second isolation layer, wherein the driver circuit provides signals to the second and fourth passive components.
23. The isolator of claim 22 wherein the first and second isolation layers are a single layer.
24. The isolator of claim 14 wherein the first and second passive components are referenced to separate, galvanically isolated grounds, and further including a Faraday shield between the first and second passive components, with the Faraday shield referenced to the same ground as the second passive components.
25. The isolator of claim 21, wherein the third and fourth passive components are capacitor plates.
26. The isolator of claim 21, wherein the first, second, third, and fourth passive components are coils.
27. The isolator of claim 26 wherein the first and second passive components are referenced to separate, galvanically isolated grounds, and further including a Faraday shield between the first and second passive components, with the Faraday shield referenced to the same ground as the second passive components.